

**DRUG DELIVERY APPARATUS AND METHOD
FOR DELIVERING A THERAPEUTIC SUBSTANCE**

Steven Z. Wu

Deborra Sanders-Millare

5

Sameer Harish

Ryan J. Santos

Li Chen

ABSTRACT

10 An apparatus and associated method for delivering a therapeutic substance to a vascular lumen, using an implantable prosthesis, such as a stent, which has grooves or trenches formed thereon. The grooves are formed on specific regions of the stent struts to increase the flexibility of the stent. The grooves also provide a therapeutic material carrying capability for treating intravascular ailments, such as
15 instant restenosis and thrombosis. The therapeutic material loading of the grooves can be accomplished in several ways. For example, a pure therapeutic material or a pre-mixed material with a polymer solution, which enhances the adhesion properties of the material, may be deposited directly in to the grooves using conventional spray or modified dip techniques. In another example, a
20 microextruded monofilament therapeutic material can be wound about the stent, such that the monofilament becomes embedded in the grooves.